



October 15-18, 2008

Wednesday, October 15, 2008

4:00 - 6:00pm Registration

Tutorial: 8:00-8:30am Tutorial Registration; Presentation and Demonstrations 8:30am – 5:00pm

Thursday, October 16, 2008

7:30 - 9:00pm Registration

8:30am Welcome: **Sanjay Kumar**

Session I: New AFM-based instrumentation for biology and medicine

Session Chair: **Daniel Fletcher**
University of California Berkeley, USA

8:55am **Chair Introduction**

9:00am **Thomas Perkins**
University of Colorado, Boulder, CO, USA
Ultrastable atomic force microscopy: atomic-scale lateral stability and registration in ambient conditions

9:30am **Ozgur Sahin**
Harvard University, Cambridge, MA, USA
Mapping stiffness and surface charge density of membrane proteins with microsecond force spectroscopy

9:50am **Hamdi Torun**
Georgia Institute of Technology, Atlanta, GA, USA
Micromachined membrane probes for parallel single molecule force spectroscopy

10:10am Break

10:50am **Nicholas Melosh**
Stanford University, Stanford, CA USA
Lateral fusion of lipid membranes to nanoscale functionalized posts

11:20am **Allard J. Katan**
Leiden University, Leiden, The Netherlands
Quantitative dynamic force spectroscopy with miniature cantilevers: taking the direct measurement of molecular interactions two steps further

11:40am **Tomoji Kawai**
Osaka University, Japan
Biological processes on a membrane observed by atomic force microscopy

12:00pm **Robert W. Cohn**
University of Louisville, Louisville, KY, USA
AFM Probes with Selectively Attached and Oriented Ultra-High Aspect Ratio Metal Nanoneedles and Their Applicability to in situ Measurements and Manipulations of Soft Biomaterials

12:20pm **Daniel A Fletcher**
University of California, Berkeley, CA, USA
Modified AFMs for cell mechanical measurements

12:50pm Lunch and Posters (All Sessions)

Session II: Biomolecular Force Spectroscopy

Session Chair: **Christopher Yip**
University of Toronto, Canada

2:45pm **Chair Introduction**

2:50pm **Daniel J. Müller**
Biotechnology Center, University of Technology Dresden, Dresden, Germany
Characterizing interactions that modulate the functional state of single membrane proteins

3:20 pm **Volkmar Heinrich**
University of California, Davis, CA, USA
Prospects and perils of single-molecule force-spectroscopy on live cells

3:40pm **Jeffrey G. Forbes**
Laboratory of Muscle Biology, NIAMS, Bethesda, MD, USA
Nebulin elasticity and unfolding of transient α -helices: a stretched protein ruler pre-loads thin filaments of the skeletal muscle

4:00pm **Joost te Riet**
Radboud University, Nijmegen, The Netherlands
Distinct kinetic and mechanical properties govern ALCAM-mediated interactions as shown by single-molecule force spectroscopy

4:20pm Break

4:50pm **Hongbin Li**
University of British Columbia, Canada
A novel functional single-molecule binding assay via force spectroscopy

5:20pm **Christopher P. Calderon**
Rice University, Houston, TX, USA
Multiscale stochastic dynamical models calibrated from single-molecule force spectroscopy time series

5:40pm **Terry J. McMaster**
University of Bristol, U.K.
Force recognition localization of specific membrane proteins on the primary cilia on MDCK cells

- 6:00pm **Christopher Yip**
University of Toronto, Canada
Casting a Wide Net: Applications and Challenges in Force Spectroscopy
- 6:30pm **Break**
- 7:30pm **Selected Best Short Presentations/ Ten “6 minutes slots presentations”**
- 8:30pm **End**

Friday, October 17, 2008

- 8:25am **Chair Introduction**

Session III: AFM of Biomaterial Surfaces

Greg Haugstad
University of Minnesota, USA

- 8:30am **Christopher A. Siedlecki**
Pennsylvania State University
Exploring Protein-Surface Interactions in Biomaterials Science by Atomic Force Microscopy
- 9:00am **John F. Rabolt**
University of Delaware, Newark, USA
Design and AFM characterization of electrospun polymer nanofibers and collagen membranes for regenerative medicine, 3D cancer cell culture models and drug screening applications
- 9:20am **Joshua Strauss**
Worcester Polytechnic Institute, MA, USA
Immobilizing Cecropin P1 for Detection of Pathogenic E. coli
- 9:40am **Jan Bieschke**
Max Delbrueck Center for Molecular Medicine, Berlin-Buch, Germany
Remodeling of amyloid fibrils by the polyphenol EGCG monitored in situ by AFM
- 10:00am **Break**
- 10:30am **Harald Fuchs**
Westfälische Wilhelms-Universität Münster, Germany
Nanoscopy: Novel Concepts and Application to Biomedicine
- 11:00am **Libai Huang**
Argonne National Laboratory, Argonne, Illinois, USA
Ultrafast Imaging of Photosynthetic Solar Energy Flow
- 11:20am **Seung-Wuk Lee**
University of California, Berkeley, CA, USA
Microscopic analyses of bone mineral dissolution
- 11:40am **Greg Haugstad**
University of Minnesota, USA
Environmental Digital Pulsed Force Mode AFM in Biomedical Coatings Research
- 12:10pm **Lunch and Posters (All Sessions)**

Session IV: AFM of Cells

Session Chair: **Michel Grandbois**
University of Sherbrooke, Canada

2:05pm **Chair Introduction**

2:10pm **Jan H. Hoh**

John Hopkins University, Maryland, USA
Micromechanical mapping of cell derived extracellular matrix

2:40pm **Helen McNally**

Purdue University, Indiana, USA
Imaging the Cellular Cytoskeleton with Atomic Force Microscopy

3:00pm **Sanjay Kumar**

University of California, Berkeley, USA
Probing molecular and cellular mechanobiology in the nervous system

3:20pm **Peter Schön**

University of Münster, Germany
Mechanically induced membrane potential change of living endothelial cells observed in real time by combined AFM-fluorescence microscopy

3:40pm **Break**

4:10pm **Manfred Radmacher**

University of Bremen, Germany
Investigation of cellular mechanics by AFM

4:40pm **Anatol Fritsch**

Leipzig, Germany
Active and passive biomechanics of single cells and cell aggregates

5:00pm **Frank Lafont**

Pasteur Institute Lille, France
The use of Atomic Force Microscopy to study host-pathogen interaction in living cells

5:20pm **Ying Xiong**

Purdue University, Indiana, USA
Morphology and Biomechanics of Live Neuronal Growth Cones Analyzed by Atomic Force Microscopy

5:40pm **Dr. Michel Grandbois**

University of Sherbrooke, Canada
AFM-Based Force Sensing Applied to Cell Biology and Potential Applications in Drug Screening

7:00pm - 9:00pm **Gala Dinner**
Monterey Bay Aquarium

8:30pm **Presentation of Poster Award**

Saturday, October 18, 2008

Session V: Biomolecular Imaging

Session Chair: **Simon Scheuring**
Institut Curie, France

- 8:25am **Chair introduction**
- 8:30am **Yuri L. Lyubchenko**
University of Nebraska, USA.
Protein Misfolding and Aggregation: Probing with the AFM force Spectroscopy
- 9:00am **James Vesenka**
University of New England, Maine, USA
Correlation Between Huntington's Disease Control and Guanine-Rich Oligonucleotide Structure
- 9:20am **Jean-Luc Pellequer**
CEA Marcoule France.
Assembly of protein domains using high-resolution AFM topographs
- 9:40am **Lisa M. Jungbauer**
University of Illinois at Chicago, Illinois, USA
Lighting up amyloid-beta oligomers: effects of fluorophore conjugation on assembly and function
- 10:00am Break**
- 10:30am **Zhifeng Shao**
University of Virginia, USA
Insight into the pore-forming process of a bacterial toxin from atomic force microscopy
- 11:00am **Bob Turner**
University of Leeds, UK
Towards nanoscale molecular and topographic mapping of living bacteria
- 11:20am **Chanmin Su**
Santa Barbara, California, USA
High Resolution Bimolecular Imaging and Mechanical Mapping in Fluid
- 11:40am **Simon Scheuring**
Institut Curie, France
High-resolution AFM in biological research and as a medical nano-imaging tool

Conference ends promptly at noon.